ABSTRACT

A novel integrated multiple-rate optical time division multiplexing (OTDM) module is disclosed. An integrated set of modulators generates optical RZ signal streams which are then time-delayed by a set of integrated optical delay switching and combining arrays and interleaved to produce an OTDM signal. The integrated optical delay switching and combining arrays are adapted to be controllably set to various delays to facilitate interleaving of many possible bit-rates. Such an approach alleviates stability problems offered by conventional fiber-based OTDM technology, increases flexibility, aids in reducing the size, complexity, and cost. Furthermore, the OTDM chip of the present invention offers fine tuning capabilities thereby allowing for slight adjustments in the interleaving of optical signal streams if needed. The present invention also provides for the integration of an optical pulse source chip and a multiple-rate OTDM chip onto a single substrate or platform using hybrid packaging technology.